

Creative Music Production, Professional Project

Darragh Bird, Creative Limitations: How Restrictions Can Lead to

Creative Freedom, 27th of April 2026, Peter Meighan

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Abstract

This body of research aims to impose the creative restrictions of 24 track analogue tape recorders and equipment. This will be conducted in the form of a project, which would entail recording a single track, as well as documenting the process of mixing and preparation for the recording. This was deliberately picked to investigate how self-imposed restrictions can influence one's creative process and approach, which will then be evaluated.

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Introduction

This body of research will aim to explore how implementing restrictions in creativity can lead to creative freedom. In a constantly developing world where technological advancements are being made daily, with many of these advancements at one's fingertips, it can be overwhelming to make creative decisions. This poses a question of whether removing choice and applying confines can boost creativity and yield an even greater end product. These limitations are within the context of composing and writing a song, with a focus on studio and mixing workflow. Taking inspiration from the 24 track tape recorder, vintage analogue mixing consoles and the finite qualities of the equipment in comparison to modern technology, the research will discuss how creativity is affected during the process of composing and mixing a new song. To do so, the study will describe the equipment used to simulate these limitations and how it's chosen, using plug-ins to resemble and reproduce the workflow of vintage equipment, the benefit of taking inspiration from other artists, how the mixing process was completed and finally how choice paralysis and decision-making can be positively affected. The proposed methodology of implementing these limitations will also be outlined, as well as recreating the 24 track restriction digitally and how the subsequent data will be collected and presented, with an aim to place the participants and mixing engineer out of their creative comfort zone.

Lit Review

Imposing Limitations

Austin Kleon's book, *'Steal like an Artist'* (Kleon)¹, describes Kleon's personal experience with constant noise a creative person can deal with when trying to bring an original idea to fruition. Kleon states that 'nothing is more paralyzing than the idea of limitless possibilities,' and that 'the idea that you can do anything is absolutely terrifying.' In the modern world, where every possible song and songwriting tool is available at the touch of a button, choice paralysis can be a significant complication for artists. This is further discussed later in Kleon's book, as he proposes that 'the way to get over creative block is to simply place some constraints on yourself. It seems contradictory, but when it comes to creative work, limitations mean freedom.' Kleon suggests that obstructions can give more of a sense of creative freedom. This can potentially be explored by using vintage equipment that has inherent limitations, such as a 24-track limit tape recorder with only period accurate equalisers, as well as using outboard gear within the recording stages of the project. This is further reaffirmed in *'Musical Creativity: Born out of Limitations + Restrictions.'* (Funk)² wherein Funk reflects on the technology of his youth; 'at 15 years old, I got my hands on a four-track cassette tape recorder. With a \$20 microphone and a guitar, I spent my free time recording songs, ideas, and jams. Back then, I dreamt of infinite tracks and effects, pristine quality audio, millions of sounds and samples to choose from. In the age of software DAWs, my dreams have come true. Ironically, I find myself with more unfinished tracks, half-baked ideas, and hours lost fine tuning the compression on the snare drum. What happened?' (Funk).

Finding the Right Year and Gear

Building on the use of limitation in creativity, an important component to consider is what vintage gear will be selected as the basis for restrictions being imposed while creating. An impressive article by *'Vintage Digital'*³ faithfully documents the various pieces of songwriting and studio equipment released from the 1930's to the 2020's. This is a valuable source, as it presents not only vintage paraphernalia from each year of the decade, but also references

¹ Kleon, Austin. *Steal like an Artist: 10 Things Nobody Told You about Being Creative*. Workman Publishing Company, 2012.

² Funk, Brian. "Musical Creativity: Born out of Limitations + Restrictions." *DJ TechTools*, 11 Feb. 2016, www.djtechtools.com/2016/02/10/musical-creativity-is-born-out-of-limitations/

³ 'Studio Gear Timeline'. *Vintage Digital*, 2 September 2021, <https://www.vintagedigital.com.au/studio-gear-timeline/>.

existing songs that exemplify such equipment. This can be used to cross-reference what gear is best availed of within the studio to reliably create constraints when recording and mixing music. ‘Reeltoreelwarehouse’, an online reseller, is especially practical in garnering information on the various types of authentic tape reels available for purchase, including data on tape length and qualities, which will help inform the choices made in the final mixing stages of the project, as different types of tape understandably hold different standards. An important aspect to consider when wilfully implementing limitations to song recording is whether the equipment is actually available to use. ‘*Tapetown Studio*’ (Tapetown)⁴, an article discussing 10 of the ‘most important and influential studio consoles’, ranging from the 60’s-80’s, is helpful in allowing a specific console template to be recreated within a DAW (digital audio workstation) for a project, as sourcing the facilities to use a genuine vintage console can be difficult.

Plug-ins

Over 50 years on from the era of authentic tape recording, there are many different plug-ins available to use. Plug-ins, a small type of software that makes a larger type work faster, or have more features⁵, can allow anyone to affordably recreate the sounds and workflow of vintage studios and paraphernalia. One of the most famous vintage mixing consoles is the SSL console⁶. Many companies have emulated this console, with one of the best emulations being a Waves Audio plug-in⁷. This gives avid musicians and producers arguably one of the most popular vintage consoles as a plug-in, accessible within any DAW or software chosen to use, without the need for the physical SSL console. Another aspect of modern day plug-ins is the tonality and characteristics of vintage tape machines. Another popular plug-in emulation is Universal Audio’s ‘Ampex ATR-102 Mastering Tape Recorder’⁸ and the ‘Studer A800 Multichannel Tape Recorder’⁹, plug-ins that are known to replicate their respective tape machines, allowing ‘bedroom producers’ to add the textures and characteristics of tape to their

⁴ Tapetown. “Vintage Mixing Consoles That Shaped Recording Studios.” *Tapetown Studio*, 27 June 2025, www.tapetownstudio.com/post/vintage-mixing-consoles-that-shaped-recording-studios

⁵ ‘Plug-In’. *Cambridge Dictionary*, 22 Apr. 2026, <https://dictionary.cambridge.org/dictionary/english/plug-in>.

⁶ ‘The SSL Channel Strip Guide’. *Solid State Logic*, <https://solidstatelogic.com/channel-strip-guide>.

⁷ ‘SSL G-Channel Strip Plugin’. *Waves*, <https://www.waves.com/plugins/ssl-g-channel>.

⁸ “Universal Audio.” *Universal Audio*, 2025, www.uaudio.com/products/ampex-atr-102

⁹ “Universal Audio.” *Universal Audio*, 2025, www.uaudio.com/products/studer-a800-tape-recorder

own recordings. ‘*Mixonline*’¹⁰ and ‘*Vintage Digital*’¹¹ both expand on the history and significance of the Studer A800 Analogue Recorder; ‘*reeltoreelwarehouse*’ provides even more information on the 4 different types of tape available within the Universal Audio plug-ins.

Taking Inspiration

Taking inspiration from another artist is generally accepted as commonplace in the music industry; though one individual may have conjured an idea, another may be able to use it in a way no one else has thought of. There is a very important line, however, between taking inspiration and blatant plagiarism. In ‘*Steal like an Artist*’ (Kleon), Kleon mentions that ‘*stealing*’ ideas is usually safe, as long as it isn’t considered copying, by using your own creativity to make it unrecognisable from the source material. The book includes a quote from David Bowie on the subject; ‘the only art I’ll ever study is stuff that I can steal from (Kleon).’ Bowie’s sentiment strengthens the idea of ‘*stealing*’ and taking inspiration from another piece of work, and making it your own. It is important to point out that Bowie is not directly ‘*stealing*’ or ‘*copying*’. In an interview for the Red Hot Chili Peppers’ 2006 album ‘*Stadium Arcadium*’ (StupidTook)¹², when discussing the creation of the song ‘*Snow (Hey Oh)*’¹³, guitarist John Frusciante states that the main riff of the song is based on Jimi Hendrix’s style of double stops (also known as a dyad, wherein a guitarist will play two notes simultaneously)¹⁴. This was then developed into a variation of Hendrix’s style which resulted in something different and new, yet was born from the intention of taking inspiration and ‘*stealing*’ in the context of still creating something fresh. This exemplifies how art and music is constantly being manipulated, warped and taken apart by other creatives to produce new ideas.

Pros and Cons of Recording to Tape

The mystique of recording to tape is still a highly debated topic, with some people still regarding its warmth and saturation as the golden standard of music production, adding a

¹⁰ Jones, Sarah. “Studer at 70.” *Mixonline*, Oct. 2018, www.mixonline.com/recording/studer-at-70

¹¹ “The Legendary Studer A800 24 Track Analogue Recorder.” *Vintage Digital*, www.vintagedigital.com.au/studer-a800/

¹² StupidTook. SA Album Commentary: Snow ((Hey Oh)). 2007. *YouTube*, <https://www.youtube.com/watch?v=4zBP1chdo0w>.

¹³ Red Hot Chili Peppers. ‘Snow (Hey Oh).’ *Stadium Arcadium*, Warner Records, 2006.

¹⁴ ‘Guitar Double Stops: What They Are and How to Play Them’. *Applied Guitar Theory*, 9 Nov. 2021, <https://appliedguitartheory.com/lessons/guitar-double-stops/>.

quality that many choose to artificially implement to their music in post, considerably a pro of using tape to record. Two sources that discuss the history and fundamentals of tape recording ‘*Universal Audio*’¹⁵ and ‘*OpenLearn*’¹⁶ touch on an aspect of tape recording that is also being added to tracks today - ‘*tape hiss*’. In ‘*Noise Reduction: Tape Hiss as Problem and Aesthetics*’ (Schröter)¹⁷, Schröter reflects on how tape hiss, which is a random high-frequency noise resulting from the magnetic properties of tape¹⁸, was previously a major problem for producers and sound engineers, as it would force them to work within limitations that they were confined to resolve this unwanted feature specific to tape recording during its era. Now seemingly sought after, the unwanted noise emitted by magnetic tape has also become an aesthetic with the introduction of the genre of ‘noise music’, marketed as soothing frequencies to relax the listener, which gave the impression of tape-hiss being ‘*sought after*’.

During the creation of the album ‘*The Colour and the Shape*’ by Foo Fighters, the band recorded the album onto a 24 track tape recorder. Despite this restriction, they still experimented throughout the album with various sonic tonalities. One of the most noticeable and iconic techniques used by Foo Fighters on this album was double-tracking the drums for the song ‘*My Hero*’¹⁹. This technique was utilised in the recording stages for this project, accomplished by using a double tracked drum recording, with one track being recorded in a dry studio environment, while the overdub was recorded in a car park, utilising the natural reverb of the space. This was then directed to a stereo track to be mixed with the main, dry drum mix. In an interview with Sammy Hagar²⁰, Dave Grohl and Taylor Hawkins were asked if they preferred to record with analogue equipment or digital. Both answered analogue, as the workflow ‘keeps a band honest’, with Grohl further elaborating ‘I have no problem recording either way, it doesn’t matter, but I do like the restrictions that analogue poses on any band’.

¹⁵ “Universal Audio.” *Universal Audio*, 2025, www.uaudio.com/blogs/ua/analog-tape-recording-basics?srsId=AfmBOorOC4QhhrHhgRwqxwSSyd6SOxq6MaTXM7XlerKn1VbZS8sJLun3

¹⁶ “Recording Music and Sound.” *OpenLearn*, www.open.edu/openlearn/history-the-arts/recording-music-and-sound/content-section-3.3.

¹⁷ Schröter, Jens. “Noise Reduction: Tape Hiss as Problem and Aesthetics.” *Sound Studies*, vol. 11, no. 2, Informa UK Limited, July 2025, pp. 255–68, <https://doi.org/10.1080/20551940.2025.2539003>.

¹⁸ ‘Noise Reduction in Tape Recording’. *HyperPhysics*, <https://hyperphysics.phy-astr.gsu.edu/hbase/Audio/tape4.html>.

¹⁹ Foo Fighters. ‘My Hero.’ *The Colour And The Shape*, RCA Records, 1997

²⁰ AXS TV. Foo Fighters Rock Out with Sammy Hagar | Rock & Roll Road Trip. 2025. *YouTube*, https://www.youtube.com/watch?v=JeZ_KEWcN18.

Modern Day Variations

There are many modern day variations of the vintage 24 track recorders. Though they do not currently utilise actual tape, the Tascam Model 24 is a great option for a 24 track window to work within. This console and recording interface leverages an SD card to record directly in the console, allowing the user to record and mix on the go with built-in compression, EQ and effects. This device is shown extensively in AudioHaze's video '*Same Track, Two Mixes (DAW vs DAWless Mix)*'²¹. This video demonstrates the limitations of working with analogue gear, and why working with a DAW is favoured in modern recording. This device mimics the restrictive, record to device workflow of a 24 track tape recorder which is still sought after today, while also giving the user the freedom to add effects without an external unit, as opposed to a modern '*in the box*'²² experience.

Choice Paralysis

Choice paralysis is a major hurdle in the creative process. According to Anisha Patel's paper '*The Indecisive Shopper: Incorporating Choice Paralysis into the Multinomial Logit Model*'²³, 'Choice paralysis is the notion that too many options can paralyze a consumer and make them more prone to not purchasing anything at all or reverting to some default option (Patel).' Due to the expansive list of possibilities concerning modern technology, wherein anything and everything is readily available at the touch of a button especially with the use of DAWs, deciding on what compressor or type of guitar tone to use can be overwhelming when trying to execute one's creative vision. This can lead to time wasted making the smallest decision, or going for the same, comfortable selections. Brian Funk expands on this aspect of music creation and production in the article '*Musical Creativity: Born out of Limitations + Restrictions*'²⁴, where Funk states; 'I realized that creative output was not limited by the lack of gear; it was enhanced by it. I couldn't spend time testing different microphones for my guitar and various amp simulations. I couldn't waste an hour compressing drums perfectly because I

²¹ AudioHaze. Same Track, Two Mixes (DAW vs DAWless Mix). 2026. *YouTube*, <https://www.youtube.com/watch?v=ljKtVtCZc0I>.

²² 'Refers to the process of mixing a song using only a computer and software (the box) rather than external hardware'. - Ramm, Reagan. 'What Does "Mixing In The Box" Mean? (How To Mix In The Box)'. *Orpheus Audio Academy*, <https://www.orpheusaudioacademy.com/what-does-mixing-in-the-box-mean-how-to-mix-in-the-box/>.

²³ Patel, Anisha. 'The Indecisive Shopper: Incorporating Choice Paralysis into the Multinomial Logit Model'. May 2014.

²⁴ Funk, Brian. 'Musical Creativity: Born Out of Limitations + Restrictions'. *DJ TechTools*, 10 Feb. 2016, <https://djtechtools.com/2016/02/10/musical-creativity-is-born-out-of-limitations/>.

didn't have a compressor. I had to use what I had available and move forward.' (Funk). This sentiment may ring true for many artists, as it is increasingly more tempting to begin a project and become overwhelmed with choice before abandoning sometimes numerous unfinished 'demos' of songs, painstakingly spending time ruminating over each minute detail. The concept of over-analysis leading to inaction is further expanded upon in Quincy Jones' book *12 notes: On Life and Creativity*²⁵, wherein Jones explores what he calls 'Paralysis by Analysis'. This is tied into the aforementioned choice paralysis, with Jones stating, 'having endless amounts of time to work on a project is a luxury, but it can also be a breeding ground for paralysis from analysis because you allow yourself to overthink. Going straight for the goosebumps will save you time in the long run because it prevents you from trying to force your art into something it's not supposed to be. If you don't feel it, I promise you that no one else will either,' (Jones).

²⁵ Jones, Quincy. *12 Notes: On Life and Creativity*. Abrams Image, 2022.

Methodology

Limitations

For the scope of this project, when referring to a limitation, it is a personal and psychological restriction placed on what a musician or mixing engineer can and cannot do, rather than a physical restriction. For example, a mixing engineer not allowing the instrument to go over another take rather than not physically having the tactile capabilities of recording another take. This is the basis of the project, as it will be shown that by simply restricting the choices in our usual processes, we can ultimately create more and better quality bodies of work.

Why These Limitations

These limitations were chosen due to their impact on the creative thinking processes of the artist, and ease of implementing. Having a limited number of tracks and plugin options gets an artist out of their comfort zone, and encourages them think about the elements and composition required for the song to sound full and interesting before they even begin the recording process. There are, however, limitations and by-products of recording with a tape machine that were not used for the project. Namely, a 24 track tape machine would previously require a few seconds to align back to a marker within the song. While this is a limitation that could have been included in the recording process, it would be counterintuitive to artificially emulate due to the negative effects it could have to the creative flow within the studio due to it being an unnecessary complication rather than positively challenging the artist's creative process.

Choosing In The Box or Analogue

The choice to record and mix 'in the box' (ITB) or all analogue is a multifaceted decision. There is still a mystique to analogue equipment, subjectively creating mixes that sound 'better' or potentially instilling more nostalgia than digital equipment. However, this is contradicted by some of the most renowned producers and engineers. In an article by Sweetwater titled '*Is "in the Box" the Best Way to Mix? These Grammy Winners Say Yes!*'²⁶, numerous accomplished producers and engineers were asked their opinion on the matter. According to Tchad Blake, he

²⁶ McDonough, Mac. 'Is "in the Box" the Best Way to Mix? These Grammy Winners Say Yes!' *Sweetwater*, 22 July 2022, <https://www.sweetwater.com/insync/is-in-the-box-the-best-way-to-mix-these-grammy-winners-say-yes/>.

works ITB ‘99.8%’ of the time, stating ‘I’ve sold a lot of vintage stuff, like I had some Neve modules — I had LA-3As, I had a rack of API EQs and pres — I had a fair amount of stuff, and I got rid of all,’ (McDonough). This is a testament to how close in the box plug-ins can sound, and how they aid the overall mixing process. This is further expanded upon by Andrew Scheps, in a video by ‘Waves Audio’ titled ‘*Andrew Scheps: Is Mixing in the Box Just As Good As Hardware?*’²⁷. Asked if digital emulations of analogue hardware sound as good as each other, Scheps responds, ‘are they as good as? Yes, they are absolutely as good as. Do they sound identical? Well no, but no two hardware boxes sound identical especially when you get into vintage gear.’ This further cements the hypothesis that digital emulations don’t have to perfectly recreate the exact sound, more rather the vibe and characteristics of analogue gear. Though the concept for this project is based on analogue gear, many of the items required for this to be achieved are either not financially viable, or are difficult to obtain. Due to this, it was decided to work ITB, rather than with analogue gear, with Pro Tools being the DAW of choice for this project.

Song Composition

The choice to record and compose one song was a conscious decision. This was decided due time constraints and scheduling conflicts, which didn’t allow for more than one day being allocated to each instrument. Recording only one song helped minimise the risk of familiarity being developed with the song’s structure, as the musicians could be better prepared should they have to record the song again on a different day. This allowed the recording process to be completely dedicated to how the restrictions and methodology influenced the musicians performance and how they felt during recording with the restrictions in place on the day. By only having one song, the mixing engineer could also complete the mixing process to a higher standard, rather than having to mix multiple songs.

Preproduction

Preproduction started with the original demo for the project. This was originally created in Ableton, and featured the full arrangement of instruments except for vocals. This was done purposefully to allow full experimentation and creative input from the vocalist. Once the demo

²⁷ Waves Audio. ‘Andrew Scheps: Is Mixing in the Box Just As Good As Hardware?’. *YouTube*, 1 September 2020 <https://www.youtube.com/watch?v=y2Inte82v5c>.

was completed, the stems of each instrument were sent to the musicians taking part in the project, as well as practice tracks. With this completed, a project overview was completed (see Appendix A) to allow the musicians to see the schedule on which they would be recording, allowing each musician to prepare accordingly for their allocated day.

Due to the limited number of tracks on vintage tape recorders, an artist previously had to plan out the song's structure and how many tracks each instrument could take up. This was an important step in preproduction as it would inform the song's structure and elements. However, due to the limited number of tracks, an artist would have to find ways of including additional constituents to a song by using empty space on other tracks to comprise new elements. For example, if an artist wanted to add extra instruments in the verse, they would have to use some of the empty track space of a chorus instrument that wasn't playing simultaneously, as opposed to an extra track. The process of planning out the limited track's availability was implemented into the project during the preproduction stage by creating a session plan with an overview of the song's structure (see Appendix B). The creation of a mock-up of the channel effects list (see Appendix C) for each instrument was subsequent in the preproduction stage. This was important to ensure that the channel strip followed the available effects on the SSL console. With the recording plan, channel list and song structure completed, the culmination of all this planning dictated and informed the order of recording as this would advise the number of takes allocated to each instrument, which then informed the amount of takes available for comping²⁸ (see Appendix C). Due to the 24 track limit, in order to comp takes together, an artist would have to record their takes onto separate tracks, and then bounce the recordings to a final comped take. This is mentioned in *'Cakewalk'*, a blog discussing *'The Evolution of Comping'*.²⁹ For this method of comping to be achieved, an artist or engineer had to know exactly how many tracks they could use for takes of any given instrument. This methodology informed the number of takes allocated to each track for the project. Plug-ins were decided by examining the features of an SSL G series channel strip.³⁰ By doing this, it was decided that each track would have Avid's 'EQ III'³¹, which features a phase switch, a high pass (HP) and low pass (LP) filter and individual EQ points which are all featured on the SSL channel strip's EQ section. The EQ

²⁸ Comping – Short for compiling, compiles several pieces of various takes, to create a *'perfect'* take.

²⁹ Administrator. 'The Evolution of Comping'. Noel Borthwick. *Cakewalk*, 21 Oct. 2015, <https://noelborthwick.com/cakewalk/2015/10/21/the-evolution-of-comping/>.

³⁰ 'SSL G-Channel Strip Plugin'. *Waves*, <https://www.waves.com/plugins/ssl-g-channel>.

³¹ 'EQ III - EQ Plugin'. *Avid*, <https://www.avid.com/plugins/eq-iii>.

would then be followed by Avid's 'Pro Compressor'³², which would be present on every track, as well as Avid's Expander/Gate III³³ on each of the drum tracks. For the vocals in the song, Avid's 'Dynamics 3 De-Esser'³⁴ would be used to reduce sibilance in the vocal.

Applying the Limitations in the Studio

Limitations were implemented into the creative process by using only 24 tracks for the entire recording process. The concept for the recording and mixing workflow is to emulate the restrictive choices of analogue recording. With every studio now being equipped with a digital audio workstation (DAW) such as Pro Tools, the goal was to limit the amount of takes made available to the musicians, much like recording on a vintage 24 track tape recorder. Each instrument had its dedicated tracks, without the option for an extra track, as it would impede on another instruments track and take count. Therefore, each instrument was limited to its predetermined track and take amounts, which was communicated to the musicians. This was chosen to challenge the musicians to ensure they produced higher quality takes for comping, as well as ensure the mixing engineer had quality takes to comp with, rather than numerous takes with a lack of quality to the performance.

The Recording Process

The recording stage of the project was carried out in 3 different studios. Drums were recorded in Sun Studio over the course of one day, with dedicated mics for a kick in, kick out, snare top, snare bottom, hi-hat, overheads left and right, rack tom and floor tom (see Appendix D for full microphone list). Due to the drum microphones taking up 9 tracks, the drums could only be comped using 2 takes as each take would have taken up 9 channels on a 24 track recorder. Guitars were recorded in one day in Sun Studio also, with only a maximum of 8 takes allowed. After each type of guitar was recorded, e.g. the left rhythm guitar, each layer of guitar subsequently recorded had a decreasing number of takes. A 12 string acoustic guitar was

³² 'Avid Complete Plugin Bundle - Audio Plugin'. Avid, <https://www.avid.com/plugins/avid-complete-plugin-bundle>.

³³ 'Digidesign Dynamics III Expander/Gate - What To Know & Where To Buy.' *Equipboard*, February 13, 2026. <https://equipboard.com/items/digidesign-dynamics-iii-expander-gate>.

³⁴ 'Digidesign Dynamics III De-Esser - What To Know & Where To Buy'. *Equipboard*, 13 Feb. 2026, <https://equipboard.com/items/digidesign-dynamics-iii-de-esser>.

recorded and double tracked in Sun as well, with Avid's 'C1 Chorus'³⁵ being added into the channel list for the 12 string to enhance the natural '*chorusing*' of the guitar. An extra guitar was recorded in Studio 1 as this studio had different amplifiers than Sun Studios, allowing a richer layering of guitars. All electric guitars recorded in Sun Studios were recorded with two microphones, a Shure Sm57 and a Neumann U87. This allowed the guitars to be blended in '*super phase*' (Produce Like A Pro). Vocals were recorded in Studio 1 with a U87 microphone. Vocals had the biggest number of takes available in the recording process. This was done to maximise experimentation in the studio with melody and harmony. Bass was recorded in the mixing suite using a DI signal and a SansAmp³⁶ emulation. The choice to use Avid's emulation 'SansAmp PSA-1'³⁷ was based on an article previously mentioned by 'Sweetwater', where it is mentioned that Tchad Blake '*...routinely deploys Avid's SansAmp PSA-1 plug-in in lieu of his old-school stompbox.*' (McDonough).

Applying the Limitations in Mixing

The mixing process had limitations on the number and variety of plugins. The channel strip of each instrument is modelled on an SSL channel strip. Though there are many emulations of an SSL console, for the purpose of this project, it was decided to not use an emulation of the console to maximise compatibility between studios, as well as demonstrating that a limited workflow can be achieved through using the inherent ideas of a piece of gear, rather than a direct plug-in emulation. As mentioned earlier, each channel had a single EQ, with an LP and HP filter as well as individual EQ points, a phase switch, and a compressor. For drums, a gate was put in the chain, as well as a Sans-Amp emulation for bass. After this initial effects chain, a full set of Avid's 'Pultec' EQ³⁸ emulations and Avid's 'LA-2A'³⁹ compressor emulation were also used after the initial EQ and compression for finer adjustments. Each channel also had a send for a dedicated reverb and delay. Each reverb was created using Avid's 'D-Verb'⁴⁰ plug-in, as well as Avid's 'Mod Delay III'⁴¹

³⁵ 'Avid Complete Plugin Bundle - Audio Plugin'. Avid, <https://www.avid.com/plugins/avid-complete-plugin-bundle>. Accessed 26 Apr. 2026.

³⁶ 'Bass Driver DI'. *Tech 21 NYC*, <https://www.tech21nyc.com/products/sansamp-2/bassdriver-di/>.

³⁷ 'SansAmp PSA-1 - Harmonic Plugin'. Avid, <https://www.avid.com/plugins/sansamp-psa1>.

³⁸ 'Pultec Bundle - EQ Plugin - Avid'. Avid, <https://www.avid.com/plugins/pultec-bundle>.

³⁹ 'Avid Bomb Factory BF-2A - What To Know & Where To Buy'. *Equipboard*, 7 Feb. 2026, <https://equipboard.com/items/avid-bomb-factory-bf-2a>.

⁴⁰ 'D-Verb - Reverb Plugin'. Avid, <https://www.avid.com/plugins/d-verb>.

⁴¹ 'Avid Mod Delay III - What To Know & Where To Buy'. *Equipboard*, <https://equipboard.com/items/avid-mod-delay-iii>.

The Mixing Process

The mixing process was completed throughout the recording stage, with rough mixes being completed throughout. The decision to not include a professional mixing engineer was chosen to enable the project's mixing engineer to experience the restrictions placed on them.

The drums were mixed as a double track, with one of the set of drum tracks being heavily reverbed. This was then bounced to a stereo track which emulated the drum timbre and method of the Foo Fighters song "*My Hero*". This was done to add depth and character to the overall drum sound. Each element of the drum kit had a gate placed to reduce microphone bleed between the tracks. When comping takes together, the options for which takes were useable was decided by the number of takes allocated. For example, if the track can only have 8 takes, but has 10 recorded, and takes 2 and 4 were "recorded over", then the remaining tracks could only be used for the comp. The left and right rhythm guitars were mixed with a blend of both the Sm57 and the U87. These two microphone signals were bounced to a single, mono track. All instruments were mixed in accordance to their reference tracks.

Validating the Process

In order to gauge the impact of these limitations on the participants, it was decided to conduct a qualitative questionnaire, outlining how the participants felt before, during and after the recording process, as well as if they would use any of the limitations used themselves in their own workflow. This would ascertain the impact of the projects constrictions, allowing an insight to how the chosen musicians would feel being pushed out of their comfort zones. The questionnaire also featured a quantitative question to receive a numerical value for the success of the project as a whole.

Analysis

Feedback from the Participants

The questionnaire outlined in the methodology featured a mixture of qualitative and quantitative questions (see Appendix E). This was chosen to ascertain both personal views, as well as statistical data for how the project performed.

When asked if they felt any choice paralysis when choosing tones, plug-ins or number of elements in a track, all the musicians included agreed that they have felt choice paralysis at some point within their usual workflow. When asked about their thoughts and opinions before, during and after the recording process, the participants stated they felt nervous before and during the recording, but ultimately were satisfied with their performance after the recordings were completed. Overall the quality of each performance was high, to which the participants agreed.

For the quantitative question sent to the participants, asking the participants to score the process overall, a mean average of 9.5/10 (with 1 being dissatisfied and 10 being satisfied) was received from the participants. When asked if they would use any of the restrictions placed on them in their own workflow, the participants stated that they would use this process themselves, especially if they were booking an expensive studio and didn't have the financial freedom to afford more studio time. Another point that was brought up in relation to this question was the tendency to over-record vocal tracks, which can make comping and mixing difficult as the artist can be afflicted with choice paralysis, leading to overcomplication or simple inaction.

Discussion

Merits

The recording process was successful in achieving the limited takes workflow, as the musicians knew the predetermined number of takes they had allocated to them as well as knowing any take that was recorded over the maximum take amount would not be useable. This added pressure ensured the musicians prepared thoroughly before recording, allowing them to maximise the quality of each take, which yielded a greater number of useable takes in the final mixing process. Receiving a score with a mean average of 9.5/10 when the participants were asked how they felt about the concept and process as a whole, the project's hypothesis was well received by the musicians, with all participants stating they would use the concepts illustrated in the future for various applications. The answer to 'Would you use any of these limitations again in your own process?' yielded interesting results, as the participants mentioned using these limitations should they have limited studio time, which touches on the fact that studio time is not free, and an artist must work within a certain allotted time-frame when renting a studio. The misconception of having unlimited studio time is not fully comprehended, which makes the time allocated to the studio stressful when time begins to run out. By imposing these limitations, decision making can be fast-tracked to enable as much recording as possible without over-recording, especially when dealing with high level clients, who may not need to record over 5 tracks as there is enough in those 5 takes to make a comp.

Demerits

During recording, though there was a limit to the amount of takes allowed to be used, there was nothing to stop extra takes being recorded. This could be better controlled by utilising Pro Tools' destructive recording feature⁴², which would permanently delete takes that were recorded over, better adhering to the limited take philosophy. In the preproduction plan, the order of recording was planned to be in the order of drums, vocals, bass and guitars. However, due to scheduling conflicts, the order had to be changed to accommodate, though the number of takes stayed the same.

⁴² Thornton, Mike. 'Pro Tools: Destructive Actions'. *Sound On Sound*, <https://www.soundonsound.com/techniques/pro-tools-destructive-actions>. Accessed 25 Apr. 2026.

Another area for improvement in the project is the questionnaire. The choice to use a Word document, as well as making the questionnaire asynchronous was not sufficient in gathering long form, elaborated answers from the musicians. This could be done better by using a Forms questionnaire to properly gather the data and responses, and/or interviewing the musicians in person to allow a natural flow of conversation to elaborate exactly how the musicians reacted to the workflow. This would also allow the participants to express how they felt before, during and after the recording stage faithfully, as the experience would have been ongoing, rather than reflecting on the experience weeks after it occurred. As well as the format choice, the lack of a research backed questioning or interviewing is a major drawback in the results. Having a research backed questionnaire or interview would yield results and data that could not be concluded from the questionnaire used, and would include long form answers that would allow the participants to thoroughly explain their rationale during the project.

Due to the project only including 4 participants, it would strengthen the projects restrictions to impose the limitations on a full production team, including an artist, producer and mixing engineer. This would allow sufficient data and findings to be explored in all areas of the production process, rather than only a handful.

Conclusion

How The Project Could Be Improved

The recording process was successful in only using the allocated number of takes for each track. However, to ensure this restriction is adhered to for future recordings, deleting unusable takes would have been more inlying when executing the original hypothesis, as it ensured that those takes were not useable, much like on an authentic tape recorder. Using the aforementioned destructive recording feature in Pro Tools would also help ensure that extra takes cannot be used. The use of a real 24-track recorder and analogue outboard equipment, without the use of any digital audio workstation, would make the process more authentic with limitations being naturally placed. This would make the entire process restrictive and different as it would require a new workflow and challenge the artist creatively and mentally if the equipment could be obtained. The order of recording that was decided in the preproduction stage should be adhered to in future recordings, especially if using a genuine 24 track recorders as scheduling conflicts would interfere with the number of takes of the other instruments. Utilising an experienced mixing engineer would also yield a higher quality final mix, as the mix was completed to an amateur level, without the necessary experience to produce a professional quality mix.

Future Directions

The limitations explored in this paper could be used for future recordings, as the workflow aided with faster decision making. Using these methods and its constraints to record a full album would allow for a more professional standard of preproduction to be achieved, as well as yielding a more cohesive sound between songs, in conjunction with creatively challenging the artist in interesting ways. Utilising an experienced mixing engineer would vastly improve the final mix, as the mix was completed to an amateur level. Minimising the track count to 16 or even 4 tracks would create new challenges in the recording and mixing stages which could be explored further. The methods outlined in this project were positive in crucial decision making in the project, which lead to a finished product that still felt exciting throughout.

Appendices

Appendix A

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Darragh end of week done list	tasks are completed. Red when not
16th of Febuary	Owen Studio	Unavailable	Unavailable	Studio Sun Gtrs 9:30-3:30	Sorcha Studio	Work	Work	Guitars comped	
23rd of Febuary	Owen Studio	Sorcha Studio	Unavailable	Studio Sun Drums 9:30-3:30	Unavailable	Work	Work	Drums comped and Gtrs mixed	
2nd of March	Studio 1 Guitars 9:30-3:30	Unavailable	Unavailable	Sorcha Studio	Unavailable	Work	Work	Full song comped and mixed	
9th of March	Vox 9:30-3:30 Mixing Suite & Bass 5pm-10pm	Owen Studio and Sorcha studio	Sorcha Studio	Mixing Suite 3pm-9pm	Unavailable	Work	Work	Full song mixed	
16th of March	Unavailable	Paddys Day	Pete Mentor meeting @10 am	Writing Thesis	Writing Thesis	Work	Work	Questionnaire finished and sent	
23rd of March	Writing Thesis	Writing Thesis	Owen Studio	Writing Thesis	Owen Studio	Work	Work	Questionnaire completed	
30th of March	Easter Break	Easter Break	Easter Break	Easter Break	Easter Break Good Friday Gig COZ	Work	Work	Write Thesis over Easter week	
6th of April	Easter Break	Easter Break	Easter Break	Easter Break	Easter Break	Work	Work	Write Thesis over Easter week	
13th of April	Writing Thesis	Writing Thesis	Writing Thesis	Writing Thesis	Writing Thesis	Work	Work		
20th of April	Writing Thesis	Writing Thesis	Writing Thesis	Writing Thesis	Pete Mentor meeting @1 pm	Work	Work		
27th of April	Final Submission					Work	Work		

- *Project overview*

Appendix B

Channel list	
Channel 1	Kick In
Channel 2	Kick Out
Channel 3	Snare Top
Channel 4	Snare Bot
Channel 5	Hi-Hat
Channel 6	OH L
Channel 7	OH R
Channel 8	Hi Tom
Channel 9	Floor Tom
Channel 10	Drum Ovd L
Channel 11	Drum Ovd R
Channel 12	Lead Vox Bus
Channel 13	Backing Vox L
Channel 14	Backing Vox R
Channel 15	Bass DI
Channel 16	Guitar RTM L
Channel 17	Guitar RTM C
Channel 18	Guitar RTM R
Channel 19	Guitar OVD L
Channel 20	Guitar OVD R
Channel 21	Gtr Solo L
Channel 22	Gtr Solo R
Channel 23	12 String L
Channel 24	12 String R
	Guide Bass
	Guide Guitar
	Groove

- Session plan

INTRO	VERSE 1	CHORUS 1	INTERLUDE	VERSE 2	CHORUS 2	BREAKDOWN	SOLO	CHORUS 3
Kick In	Kick In	Kick In	Kick In	Kick In	Kick In	Kick In	Kick In	Kick In
Kick Out	Kick Out	Kick Out	Kick Out	Kick Out	Kick Out	Kick Out	Kick Out	Kick Out
Snare Top	Snare Top	Snare Top	Snare Top	Snare Top	Snare Top	Snare Top	Snare Top	Snare Top
Snare Bot	Snare Bot	Snare Bot	Snare Bot	Snare Bot	Snare Bot	Snare Bot	Snare Bot	Snare Bot
Hi-Hat	Hi-Hat	Hi-Hat	Hi-Hat	Hi-Hat	Hi-Hat	Hi-Hat	Hi-Hat	Hi-Hat
OH L	OH L	OH L	OH L	OH L	OH L	OH L	OH L	OH L
OH R	OH R	OH R	OH R	OH R	OH R	OH R	OH R	OH R
Hi Tom	Hi Tom	Hi Tom	Hi Tom	Hi Tom	Hi Tom	Hi Tom	Hi Tom	Hi Tom
Floor Tom	Floor Tom	Floor Tom	Floor Tom	Floor Tom	Floor Tom	Floor Tom	Floor Tom	Floor Tom
Drum Ovd L	Drum Ovd L	Drum Ovd L	Drum Ovd L	Drum Ovd L	Drum Ovd L	Drum Ovd L	Drum Ovd L	Drum Ovd L
Drum Ovd R	Drum Ovd R	Drum Ovd R	Drum Ovd R	Drum Ovd R	Drum Ovd R	Drum Ovd R	Drum Ovd R	Drum Ovd R
	Lead Vox Bus	Lead Vox Bus	Lead Vox Bus	Lead Vox Bus	Lead Vox Bus	Lead Vox Bus	Lead Vox Bus	Lead Vox Bus
				Backing Vox L	Backing Vox L	Backing Vox L	Backing Vox L	Backing Vox L
				Backing Vox R	Backing Vox R	Backing Vox R	Backing Vox R	Backing Vox R
Bass DI	Bass DI	Bass DI	Bass DI	Bass DI	Bass DI	Bass DI	Bass DI	Bass DI
Guitar RTM L	Guitar RTM L	Guitar RTM L	Guitar RTM L	Guitar RTM L	Guitar RTM L	Guitar RTM L	Guitar RTM L	Guitar RTM L
Guitar RTM C	Guitar RTM C	Guitar RTM C	Guitar RTM C	Guitar RTM C	Guitar RTM C	Guitar RTM C	Guitar RTM C	Guitar RTM C
Guitar RTM R	Guitar RTM R	Guitar RTM R	Guitar RTM R	Guitar RTM R	Guitar RTM R	Guitar RTM R	Guitar RTM R	Guitar RTM R
		Guitar OVD L		Guitar OVD L	Guitar OVD L	Guitar OVD L	Guitar OVD L	Guitar OVD L
		Guitar OVD R		Guitar OVD R	Guitar OVD R	Guitar OVD R	Guitar OVD R	Guitar OVD R
							Gtr Solo L	
							Gtr Solo R	
				12 String L			12 String L	
				12 String R			12 String R	

- Song structure overview

Appendix C

Channel Strip	
Sans-amp	For Bass
EQ	
Compressor	
Gate	For Drums
Chorus	For 12 string
Pultec EQH-2	
Pultec EQP-1A	
Pultec MEQ-5	
LA-2A Comp	
SENDS	
Delay	Independent for each group
Reverb	Independent for each group

- Channel strip effects mock-up

		Drums		Vox		VoxDouble		Harmony 1		Harmony 2
Channel 1	TAKE 1	Kick In		Kick In		Kick In		Kick In		Kick In
Channel 2		Kick Out		Kick Out		Kick Out		Kick Out		Kick Out
Channel 3		Snare Top		Snare Top		Snare Top		Snare Top		Snare Top
Channel 4		Snare Bot		Snare Bot		Snare Bot		Snare Bot		Snare Bot
Channel 5		Hi-Hat		Hi-Hat		Hi-Hat		Hi-Hat		Hi-Hat
Channel 6		OH L		OH L		OH L		OH L		OH L
Channel 7		OH R		OH R		OH R		OH R		OH R
Channel 8		Hi Tom		Hi Tom		Hi Tom		Hi Tom		Hi Tom
Channel 9		Floor Tom		Floor Tom		Floor Tom		Floor Tom		Floor Tom
Channel 10	TAKE 2	Kick In		Drum Ovd L		Drum Ovd L		Drum Ovd L		Drum Ovd L
Channel 11		Kick Out		Drum Ovd R		Drum Ovd R		Drum Ovd R		Drum Ovd R
Channel 12		Snare Top	TAKE 1	Vox		Vox		Vox		Vox
Channel 13		Snare Bot	TAKE 2	Vox	TAKE 1	VoxDouble		Vox Double		Vox Double
Channel 14		Hi-Hat	TAKE 3	Vox	TAKE 2	Vox Double	TAKE 1	Harmony 1		Harmony 1
Channel 15		OH L	TAKE 4	Vox	TAKE 3	Vox Double	TAKE 2	Harmony 1	TAKE 1	Harmony 2
Channel 16		OH R	TAKE 5	Vox	TAKE 4	Vox Double	TAKE 3	Harmony 1	TAKE 2	Harmony 2
Channel 17		Hi Tom	TAKE 6	Vox	TAKE 5	Vox Double	TAKE 4	Harmony 1	TAKE 3	Harmony 2
Channel 18		Floor Tom	TAKE 7	Vox	TAKE 6	Vox Double	TAKE 5	Harmony 1	TAKE 4	Harmony 2
Channel 19		Talkback	TAKE 8	Vox	TAKE 7	Vox Double	TAKE 6	Harmony 1	TAKE 5	Harmony 2
Channel 20	Comped from	Drum Ovd L	TAKE 9	Vox	TAKE 8	Vox Double	TAKE 7	Harmony 1	TAKE 6	Harmony 2
Channel 21	2 takes	Drum Ovd R	TAKE 10	Vox	TAKE 9	Vox Double	TAKE 8	Harmony 1	TAKE 7	Harmony 2
Channel 22		Guide Bass	TAKE 11	Vox	TAKE 10	Vox Double	TAKE 9	Harmony 1	TAKE 8	Harmony 2
Channel 23		Groove	TAKE 12	Vox	TAKE 11	Vox Double	TAKE 10	Harmony 1	TAKE 9	Harmony 2
Channel 24		Guide Guitar		Guide Guitar		Guide Guitar		Guide Guitar		Guide Guitar

- Example of recording plan created, full version available in supporting materials

Appendix D

Drum microphone list	
Kick in	D112
Kick out	Senn e902
Snare top	Sm57
Snare bottom	Sm57
Hi-hat	C451
OHL	C414
OHR	C414
High tom	Senn e604
Floor tom	MD 421
Talkback	Sm58

- *Full list of microphones used for drums. Full list of all microphones used in the project available in supporting materials.*

Appendix E

Recording with limitations questionnaire

- What process and approach would you normally use for recording yourself or others for a song?

- Do you feel any choice paralysis when choosing tones, plugins or number of elements in your recording process?

- How did you feel about recording with a limited number of takes *before* the recording process?

- How did you feel about recording with a limited number of takes *during* the recording process?

- How did you feel about recording with a limited number of takes *after* the recording process?

- Would you use any of these limitations again in your own process?

- On a scale of 1-10, 1 being dissatisfied, 10 being satisfied, how did you feel about the process and concept as a whole while participating in the project? Please feel free to elaborate on why.

- Is there any limitations or areas that were limited that you would change or add if you were to participate in this project again?

- *Questionnaire sent to participants*

Bibliography

- Administrator. 'The Evolution of Comping'. Noel Borthwick. *Cakewalk*, 21 Oct. 2015, <https://noelborthwick.com/cakewalk/2015/10/21/the-evolution-of-comping/>.
- Adriatico, Jessa Mae, et al. 'An Analysis on the Impact of Choice Overload to Consumer Decision Paralysis'. *Journal of Economics, Finance and Accounting Studies*, vol. 4, no. 1, Jan. 2022, pp. 55–75. *al-kindipublishers.org*, <https://doi.org/10.32996/jefas.2022.4.1.4>.
- 'Ampex ATR-102 Mastering Tape Recorder – Universal Audio'. *Universal Audio*, <https://www.uaudio.com/products/ampex-atr-102>. Accessed 27 Apr. 2026.
- 'Analog Tape Recording Basics – Universal Audio'. *Universal Audio*, <https://www.uaudio.com/blogs/ua/analog-tape-recording-basics?srsltid=AfmBOorOC4QhhrHhgRwqxwSSyd6SOxq6MaTXM7XlerKn1VbZS8sJLun3>. Accessed 27 Apr. 2026.
- AudioHaze. *Same Track, Two Mixes (DAW vs DAWless Mix)*. 2026. *YouTube*, <https://www.youtube.com/watch?v=ljKtVtCZc0I>.
- 'Avid Bomb Factory BF-2A - What To Know & Where To Buy'. *Equipboard*, 7 Feb. 2026, <https://equipboard.com/items/avid-bomb-factory-bf-2a>.
- 'Avid Complete Plugin Bundle - Audio Plugin'. *Avid*, <https://www.avid.com/plugins/avid-complete-plugin-bundle>. Accessed 26 Apr. 2026.
- 'Avid Mod Delay III - What To Know & Where To Buy'. *Equipboard*, <https://equipboard.com/items/avid-mod-delay-iii>. Accessed 27 Apr. 2026.
- AXS TV. *Foo Fighters Rock Out with Sammy Hagar | Rock & Roll Road Trip*. 2025. *YouTube*, https://www.youtube.com/watch?v=JeZ_KEWcN18.

‘Bass Driver DI’. *Tech 21 NYC*, <https://www.tech21nyc.com/products/sansamp-2/bassdriver-di/>. Accessed 24 Apr. 2026.

‘Digidesign Dynamics III De-Esser - What To Know & Where To Buy’. *Equipboard*, 13 Feb. 2026, <https://equipboard.com/items/digidesign-dynamics-iii-de-esser>.

Digidesign Dynamics III Expander/Gate - What To Know & Where To Buy. 13 Feb. 2026, <https://equipboard.com/items/digidesign-dynamics-iii-expander-gate>.

‘D-Verb - Reverb Plugin’. *Avid*, <https://www.avid.com/plugins/d-verb>. Accessed 27 Apr. 2026.

‘EQ III - EQ Plugin’. *Avid*, <https://www.avid.com/plugins/eq-iii>. Accessed 26 Apr. 2026.

Foo Fighters. ‘My Hero.’ *The Colour And The Shape*, RCA Records, 1997

Foo Fighters. *The Colour And The Shape*. 1997. www.discogs.com, <https://www.discogs.com/master/62129-Foo-Fighters-The-Colour-And-The-Shape>.

Funk, Brian. ‘Musical Creativity: Born Out of Limitations + Restrictions’. *DJ TechTools*, 10 Feb. 2016, <https://djtechtools.com/2016/02/10/musical-creativity-is-born-out-of-limitations/>. Production Tips.

Germany, Teac Europe GmbH, Wiesbaden. *Tascam Model 24 | 22-Channel Analogue Mixer With 24-Track Digital Recorder*. <https://tascam.eu/en/model24>. Accessed 23 Apr. 2026.

‘Guitar Double Stops: What They Are and How to Play Them’. *Applied Guitar Theory*, 9 Nov. 2021, <https://appliedguitartheory.com/lessons/guitar-double-stops/>.

Jones, Quincy. *12 Notes: On Life and Creativity*. Abrams Image, 2022.

Kleon, Austin. *Steal Like an Artist*. WORKMAN PUBLISHING COMPANY, 2012.

McDonough, Mac. ‘Is “in the Box” the Best Way to Mix? These Grammy Winners Say Yes!’ *Sweetwater*, 22 July 2022, <https://www.sweetwater.com/insync/is-in-the-box-the-best-way-to-mix-these-grammy-winners-say-yes/>.

‘Michael Brauer: Mix Engineer Behind Iconic Records’. *Tape Op Magazine*, <https://tapeop.com/interviews/131/michael-brauer>. Accessed 25 Apr. 2026.

‘Noise Reduction in Tape Recording’. *HyperPhysics*, <https://hyperphysics.phy-astr.gsu.edu/hbase/Audio/tape4.html>. Accessed 27 Apr. 2026.

Patel, Anisha. *The Indecisive Shopper: Incorporating Choice Paralysis into the Multinomial Logit Model*. May 2014.

‘Plug-In’. *Cambridge Dictionary*, 22 Apr. 2026, <https://dictionary.cambridge.org/dictionary/english/plug-in>.

‘Pro Compressor - Dynamics Plugin’. *Avid*, <https://www.avid.com/plugins/pro-compressor>. Accessed 26 Apr. 2026.

Produce Like A Pro. *Foo Fighters Everlong: Inside the Song - Warren Huart: Produce Like A Pro*. 2019. *YouTube*, <https://www.youtube.com/watch?v=1LDGYI2oaVI>.

Produce Like A Pro. *Foo Fighters’ ‘My Hero’: Inside the Song with Bradley Cook - Warren Huart: Produce Like A Pro*. 2019. *YouTube*, <https://www.youtube.com/watch?v=UN6-CBF41Sk>.

‘Pultec Bundle - EQ Plugin - Avid’. *Avid*, <https://www.avid.com/plugins/pultec-bundle>. Accessed 26 Apr. 2026.

Ramm, Reagan. ‘What Does “Mixing In The Box” Mean? (How To Mix In The Box)’. *Orpheus Audio Academy*, <https://www.orpheusaudioacademy.com/what-does-mixing-in-the-box-mean-how-to-mix-in-the-box/>. Accessed 25 Apr. 2026.

‘Recording Music and Sound’. *Open Learning*, <https://www.open.edu/openlearn/history-the-arts/recording-music-and-sound/content-section-3.3>. Accessed 27 Apr. 2026.

Red Hot Chili Peppers. ‘Snow (Hey Oh).’ *Stadium Arcadium*, Warner Records, 2006.

‘SansAmp PSA-1 - Harmonic Plugin’. *Avid*, <https://www.avid.com/plugins/sansamp-psa1>. Accessed 26 Apr. 2026.

- Schröter, Jens. 'Noise Reduction: Tape Hiss as Problem and Aesthetics'. *Sound Studies*, vol. 11, no. 2, July 2025, pp. 255–68. *Taylor and Francis+NEJM*, <https://doi.org/10.1080/20551940.2025.2539003>.
- 'SSL G-Channel Strip Plugin'. *Waves*, <https://www.waves.com/plugins/ssl-g-channel>. Accessed 26 Apr. 2026.
- 'Studer A800 Multichannel Tape Recorder'. *Universal Audio*, <https://www.uaudio.com/products/studer-a800-tape-recorder>. Accessed 27 Apr. 2026.
- 'Studio Gear Timeline'. *Vintage Digital*, 2 Sept. 2021, <https://www.vintagedigital.com.au/studio-gear-timeline/>.
- StupidTook. *SA Album Commentary: Snow ((Hey Oh))*. 2007. *YouTube*, <https://www.youtube.com/watch?v=4zBP1chdo0w>.
- Tapetown. 'Vintage Mixing Consoles That Shaped Recording Studios'. *Tapetown Studio*, 27 June 2025, <https://www.tapetownstudio.com/post/vintage-mixing-consoles-that-shaped-recording-studios>.
- 'The History of the Optical Compressor'. *AudioScape Engineering Co.*, 16 May 2025, <https://www.audio-scape.com/news/optical-history>.
- The Legendary Studer A800 24 Track Analogue Recorder*. *Vintage Digital*. 15 June 1978, <https://www.vintagedigital.com.au/studer-a800/>.
- 'The SSL Channel Strip Guide'. *Solid State Logic*, <https://solidstatelogic.com/channel-strip-guide>. Accessed 26 Apr. 2026.
- Thornton, Mike. 'Pro Tools: Destructive Actions'. *Sound On Sound*, <https://www.soundonsound.com/techniques/pro-tools-destructive-actions>. Accessed 25 Apr. 2026.
- Waves Audio. *Andrew Scheps: Is Mixing in the Box Just As Good As Hardware?* 2020. *YouTube*, <https://www.youtube.com/watch?v=y2Inte82v5c>.

Williams, Mark. 'Legacy'. *Pultec® - Pulse Techniques*, <https://pulsetechniques.com/legacy/>.

Accessed 26 Apr. 2026.